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AUTHOR Smith, Alan D.
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ABSTRACT

The use of computer graphic techniques with basic student enrollment statistics is examined to promote understanding of changes in student flow as a function of spatial distribution. Basic initial student enrollment data that serve as input into predictive flow models were modeled at Eastern Kentucky University. The following commercially available software packages were used: SYMAP, a line-printer mapping software, and three-dimensional plotting routines, QUSMO, QUSMO2, QUTAB, and QUCRS. Data on first-time freshmen entering the university from 117 Kentucky counties for 1979-1982 were examined. The three counties with the highest enrollments were not included to avoid skewing the student flow model. Four graphical displays of the student flow statistics are provided that portray: the spatial distribution of first enrolled, 1979 freshmen to Eastern Kentucky University; similar data for 1980 freshmen; 1981 enrollment statistics; and a three-dimensional model of 1982 student flows. (SW)

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COMPUTER-GENERATED, THREE-DIMENSIONAL MODELS OF STUDENT FLOW CHARACTERISTICS IN KENTUCKY: A CASE STUDY

Alan D. Smith

Department of Quantitative and Natural Sciences
Robert Morris College, Coraopolis, PA 15108

The expanding uses of computer graphics in all disciplines and its application to communicate often difficult-to-interpret data and concepts are rapidly becoming an essential tool for use in the classroom by educational practitioners. However, the usefulness of computer graphical systems must be based on its ability to communicate the results of data manipulation and ease of access. Thus, the purpose of this paper is to illustrate selected computer graphical techniques applied to basic student enrollment statistics in order to aid in visualizing changes in student flow as a function of spatial distribution. The use of statistical regression techniques to enhance prediction or modeling for institutional fit or congruence models, and student flow models have accelerated in recent years. Several researchers have constructed models of institutional fit or congruence through the years (Aitken 1982, Astin 1969, 1975, Clegg, Prichard, and Weigand, 1979). In referring to institutional fit studies, most try to relate personality and institutional characteristics with the effects of the institutional or environmental presses on student behavior and development. Rarely has a spatial dimensional element based on geographic location and their changes through the years, been incorporated into model research. The purpose of this study is to model the basic initial student enrollment data that serves as input into predictive flow models.

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The major computer graphics used in the present study are SYMAP, a line-printer mapping software, and three-dimensional plotting routines, QUSMO, QUSMO2, QUTAB, and QUCRS. All of these software packages are commercially available for the potential user (Smith 1982). The institution under study is Eastern Kentucky University, a regional, coeducational and public institution of higher education. The University offers traditional general and liberal arts programs, pre-professional and professional training in education and other disciplines at both the undergraduate and graduate levels. Situated in the heart of the Bluegrass, Richmond is 26 miles southeast of Lexington, Kentucky and is the county seat of Madison County, in a community of 21,000 people. The University currently enrolls more than 13,000 FTEs, and is still growing in student enrollment. The first time enrolled freshmen students entering the University from the Kentucky counties for the years 1979 through 1982, inclusively, were examined. The enrollment from the three most high enrollment counties (Jefferson, Fayette, and Madison) were not included in the present study so that relatively high enrollments from these counties do not skew the student flow model such that enrollments from other counties do not appear due to scaling problems. Student flow statistics were analyzed for incoming freshmen from 117 counties in Kentucky and graphically displayed, via SYMAP and QUSMO2, as illustrated in Figures 1 through 4. Figure 1 portrays the spatial distribution of first enrolled, 1979 incoming freshmen students to Eastern Kentucky University, as viewed from the northeast direction, 30 degrees from the horizontal plane. Figure 2 illustrates similar data for 1980 statistics; Figure 3 displays 1981 enrollment statistics, as viewed from the southeast direction; and Figure 4 is a computer-generated, three-dimensional model of 1982 student flows, as also viewed from the southeast direction.

As evident from a quick inspection of the graphics, the basic enrollment pattern is approximately the same for the four years studied, but the magnitudes or number of students significantly change. The major benefit of plotting this type of student enrollment information is that it more dramatically displays the information, and, hence, more effectively communicates this information. Graphic displays allow the administrator or concerned faculty member to actually view the distributions of important parameters associated with student flows and take more effective administrative measures to correct or adjust to changes in student flows, either through retention or recruitment campaigns.

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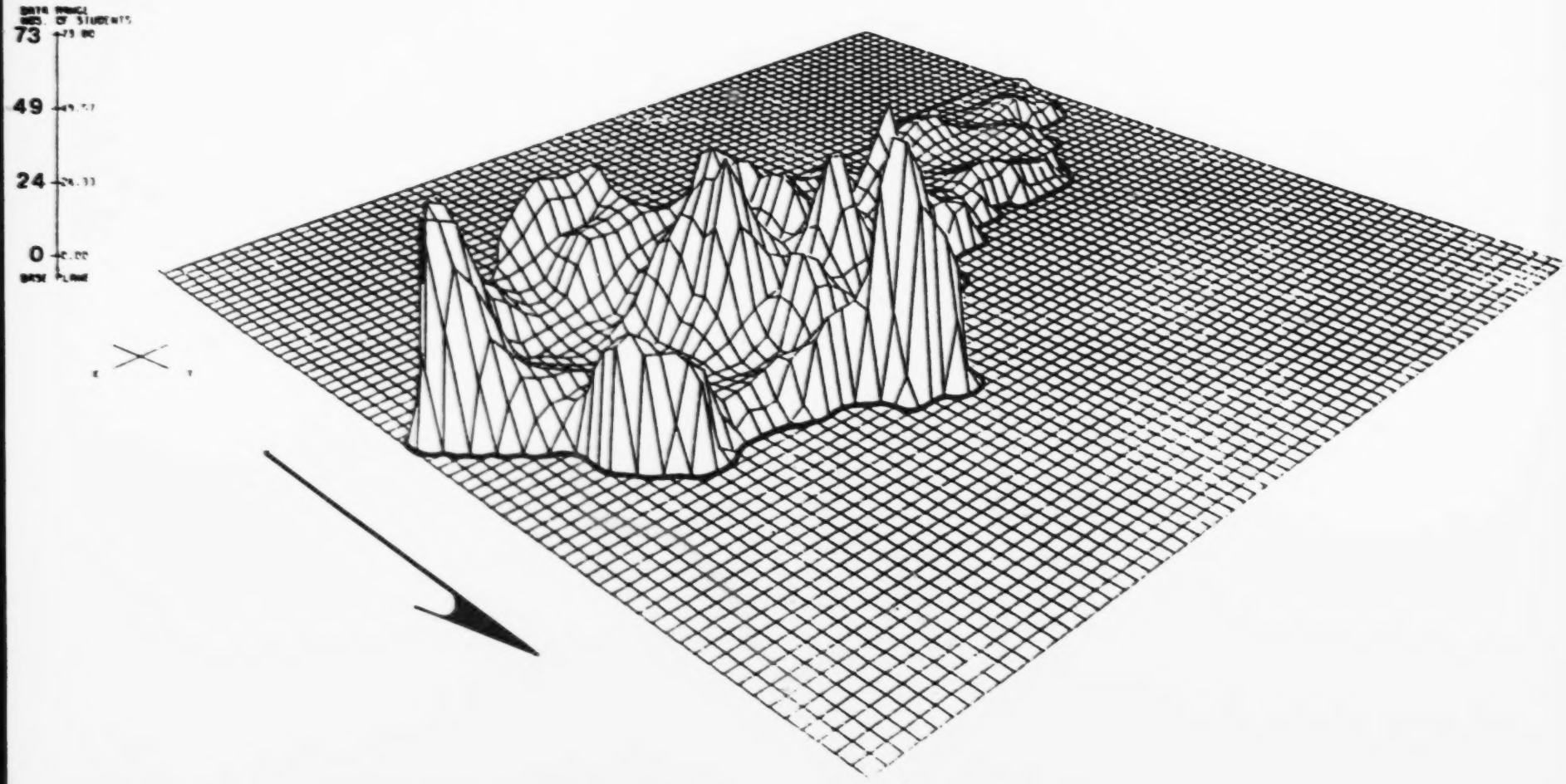
FIGURE LEGENDS

FIGURE

1. Three-dimensional display of the spatial distribution of first enrolled, 1979 incoming freshmen student flow to Eastern Kentucky University, As Viewed from the Northeast Direction.
2. Three-dimensional display of the spatial distribution of first enrolled, 1980 incoming freshmen student flow to Eastern Kentucky University, As Viewed from the Northeast Direction.
3. Three-dimensional display of the spatial distribution of first enrolled, 1981 incoming freshmen student flow to Eastern Kentucky University, As Viewed from the Southeast Direction.
4. Three-dimensional display of the spatial distribution of first enrolled, 1982 incoming freshmen student flow to Eastern Kentucky University, As Viewed from the Southeast Direction.



STUDENT FLOW MODELS -- INCOMING FRESHMEN STUDENTS 1979

1

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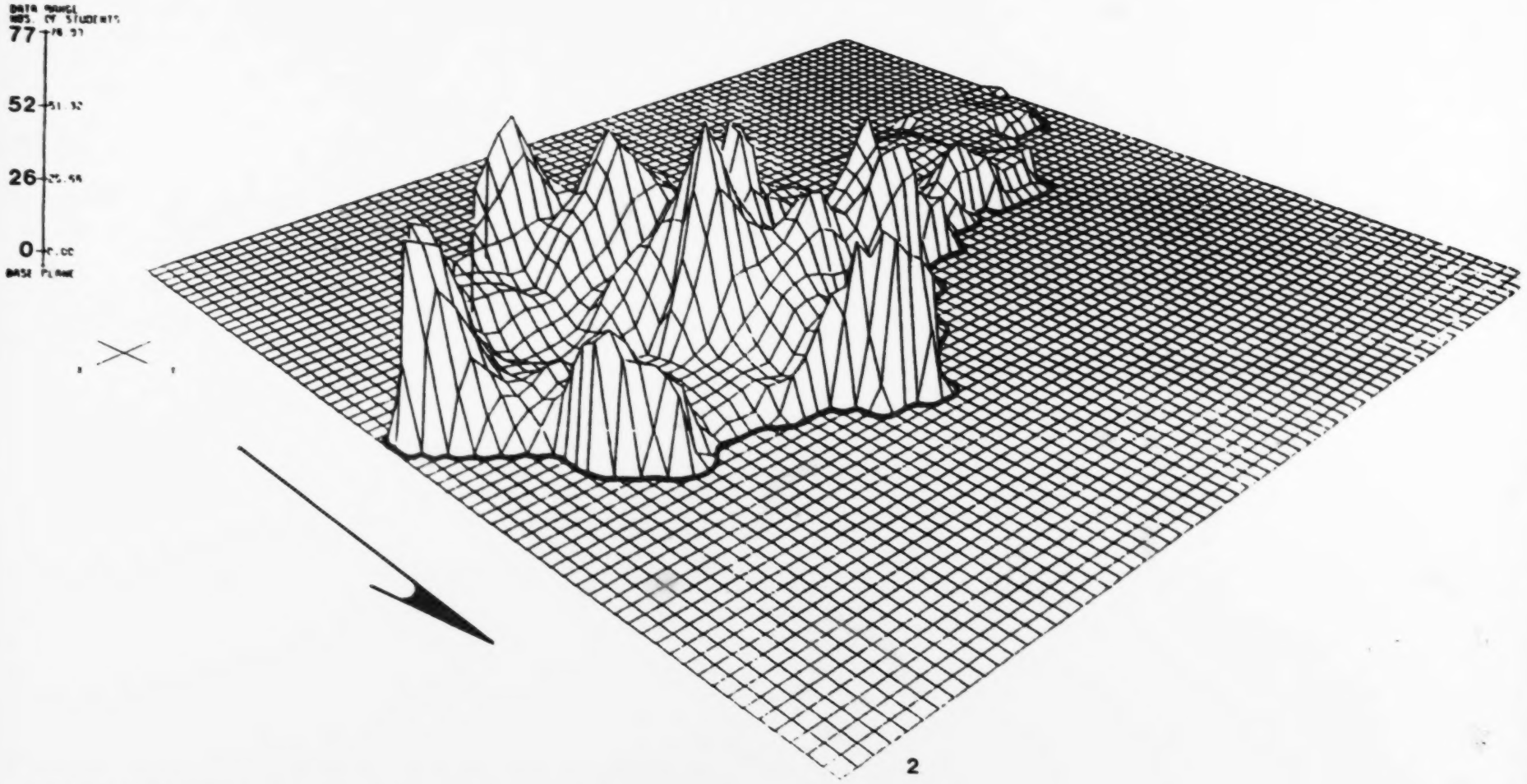

STUDENT FLOW MODELS -- INCOMING FRESHMEN STUDENTS 1980

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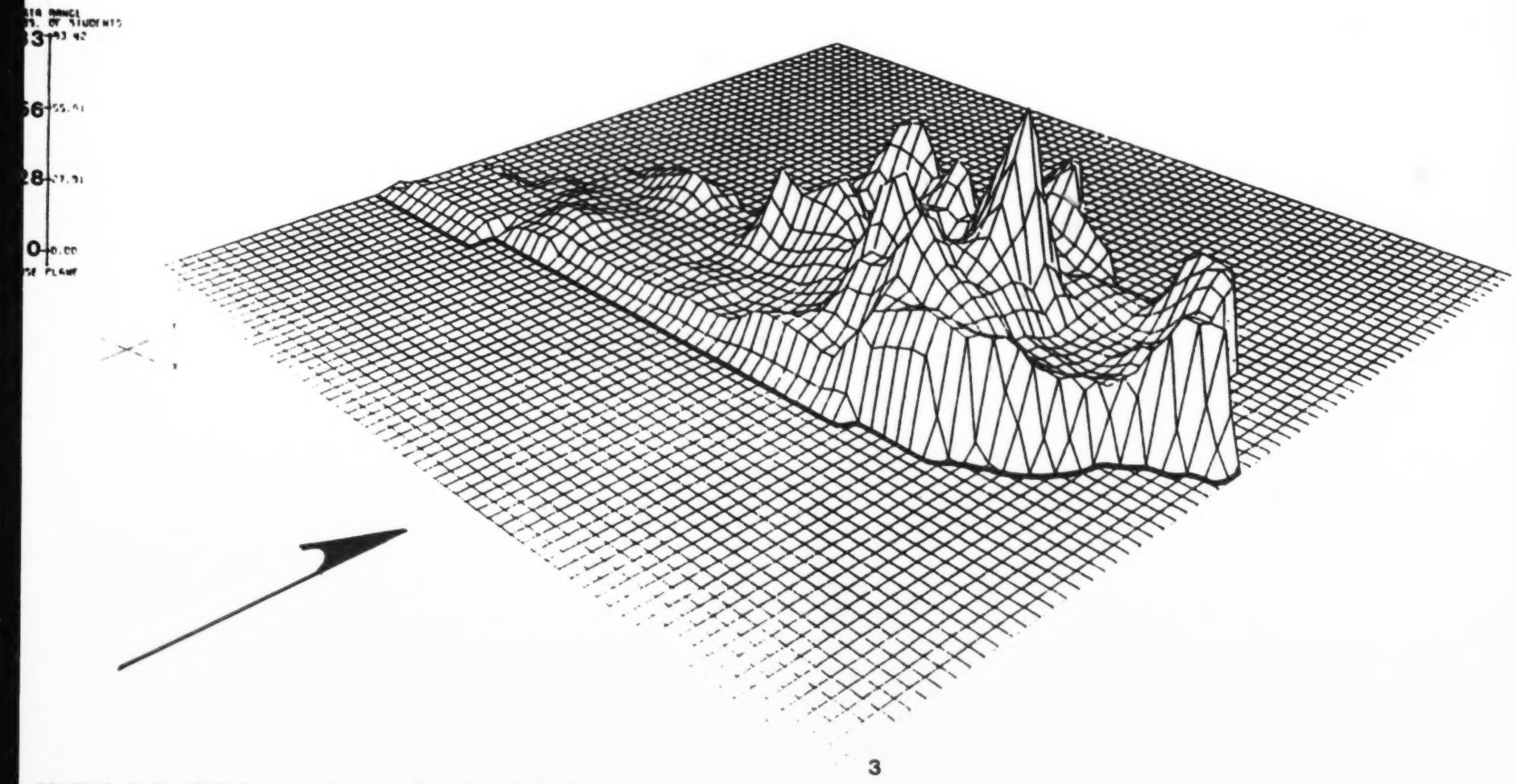
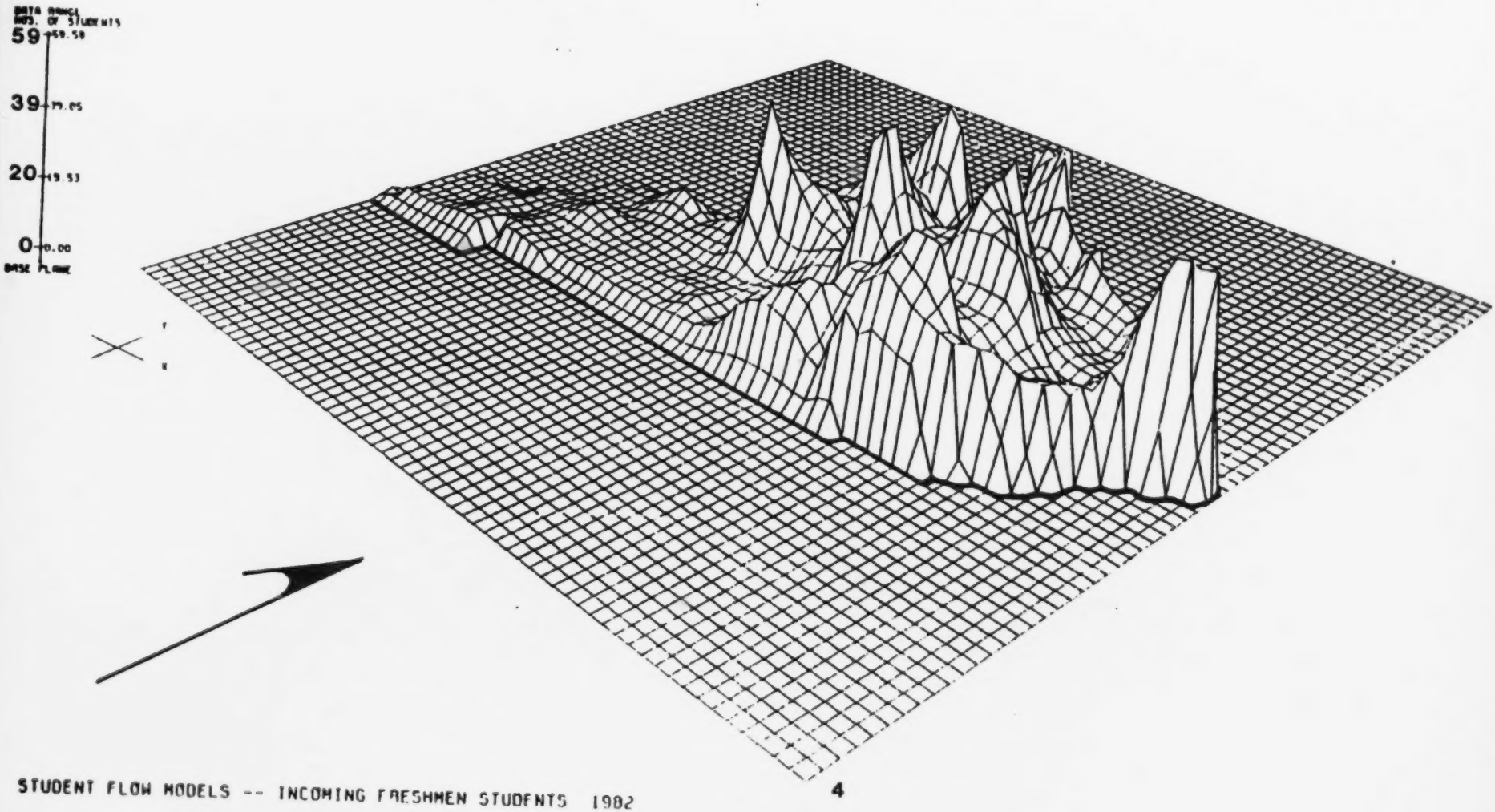


3

STUDENT FLOW MODELS - INCOMING FRESHMEN STUDENTS 1991



STUDENT FLOW MODELS -- INCOMING FRESHMEN STUDENTS 1982

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